COMPLIANTV

Compliance of TVs
with Energy Label and Ecodesign Requirements

Guidelines on television set testing

Compliance of TVs with Energy Label and Ecodesign Requirements

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Note on Regulations and Standards

Regulation 642/2009: Commission Regulation (EC) No 642/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to Ecodesign requirements for televisions.

Regulation 1062/2010: Commission Delegated Regulation (EU) No 1062/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of televisions.

EN 50564:2011: “Electrical and electronic household and office equipment. Measurement of low power consumption”.

IEC 62087: “Methods of measurement for the power consumption of audio, video and related equipment”, edition 2 or edition 3.

IDMS 1: Information Display Measurements Standard (IDMS1), version 1.03 elaborated by the International Committee for Display Metrology.

Note on Abbreviations

ABC – Automatic Brightness Control

APD – Automatic Power Down

MSA – Market Surveillance Authority

PLR – Peak Luminance Ratio

Note on Terminology

Out of the box condition – means the condition where the settings, after the initial installation, are not changed, unless it is explicitly mentioned in the Regulation (e.g. turning off the ABC as required in Regulation 642/2009, ANNEX II, part 1 (c) or in IEC 62087).

The following terminology used in these guidelines are based on the definitions given in Regulation 642/2009:

On-mode means the condition where the television is connected to the mains power source and produces sound and picture.

Standby mode means a condition where the equipment is connected to the mains power source, depends on energy input from the mains power source to function properly and offers the following functions only, which may persist for an indefinite time:

- reactivation function, or reactivation function and only an indication of enabled reactivation function, and/or,
- information or status display.

Off-mode means a condition in which the equipment is connected to the mains power source and is not providing any function; it also includes:

- (a) conditions providing only an indication of off-mode condition;
- (b) conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2004/108/EC of the European Parliament and of the Council.

Home mode means the television setting which is recommended by the manufacturer for normal home use.

Forced menu means a set of television settings pre-defined by the manufacturer, of which the user of the television must select a particular setting upon initial start-up of the television.

1. Introduction

The aim of the following guidelines is to facilitate and harmonise testing of televisions regarding the requirements of the Ecodesign (Commission Regulation No 642/2009) and Energy Labelling Directives (Commission Regulation (EC) No 1062/2010). These guidelines shall serve as a fundament for television testing until a harmonised standard has been issued as requested in M/477[1] and M/495[2].

These guidelines are based on the extensive practical experience gained from the technical testing of more than 160 television models within the ComplianTV project. The document shares key lessons acquired throughout the testing activities, especially concerning testing set-up and procedures, specific testing requirements, documentation and interpretation of test results, as well as optimisation of testing and aspects of product selection.

The guidelines include the test report template in the appendix[3], which has been specifically prepared and used by ComplianTV in order to document the testing results. The guidelines correspond to the structure of the test report template. All relevant aspects addressed by the two Directives are presented in dedicated sections. These include:

- On-mode power consumption
- Standby/off-mode power consumption
- Verification of the “home mode” requirement
- Automatic power down
- Peak luminance ratio
- Energy efficiency index and annual on-mode power consumption
- Information requirements addressed in the Ecodesign and Energy Labelling Directives

The relevant legislative requirements are summarized at the beginning of each section under “Specifications according to the Commission Regulation No 642/2009 respectively 1062/2010”. The subsection “Practical test issues” addresses the measurement procedure, including test preparations and the actual test procedure for each of the listed aspects.

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1 Mandate to CEN, CENELEC and ETSI for Standardisation in the field of television, available at: ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/Fields/EnergySustainability/Labelling/M_477.pdf

2 Standardisation mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonised standards in the field of Ecodesign, available at: ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/Fields/EnergySustainability/Labelling/M_495.pdf

3 A workable version of the test report template is also available on the project website.

1. Introduction

Also included are notes regarding issues that may occur during testing. The third subsection of each aspect “Lessons learnt and recommendations for best practice” presents key lessons learnt during the testing procedures and gives specific advice to avoid issues that may occur.

At the end of the document, the measurement uncertainties and tolerances are summarised, which are relevant for the parameters tested within the ComplianTV project.

This report aims to build on the activities and lessons learnt from the laboratory testing activities that have been performed in order to offer guidance to MSAs and other partners potentially conducting laboratory testing. The content of this report is closely linked to another report dedicated to policy recommendations (available on the project website, see “Recommendations based on lessons learnt within ComplianTV, regarding the draft Ecodesign and Energy Label Regulations on electronic displays[4]”).

Another guidelines document is dedicated to shop and webshop inspections which have been carried out within the ComplianTV project.

4 http://www.compliantv.eu/eu/product-testing/discussions-and-policy-recommendations/

2. On-mode power consumption

2.1 Specifications according to the Commission Regulation No 642/2009 and Commission Regulation No 1062/2010

ANNEX I – Ecodesign Requirements

- According to ANNEX I, part 2, the on-mode power consumption for all resolutions television sets with visible screen area A expressed in dm^2 should not exceed the limit defined by using the following formula:

$$P_{ref} = 16 \text{ Watts} + A \times 3{,}4579 \text{ Watts/dm}^2$$

ANNEX II – Measurement (Test Procedures)

According to Annex II, part 1 (b), the measurement conditions should be as followed:

- For television sets without forced menu the power measurements "shall be made in the on-mode condition of the television as delivered by the manufacturer, that is, the brightness controls of the television shall be in the position adjusted by the manufacturer for the end user".
- For television sets with forced menu the power consumption "shall be measured in the "home-mode" condition".

According to ANNEX II, part 1 (c), the following general measurement conditions are stipulated:

- "Measurements shall be made at an ambient temperature of 23 °C +/– 5 °C".
- "Measurements shall be made using a dynamic broadcast-content video signal representing typical broadcast TV content. The measurement shall be the average power consumed over 10 consecutive minutes".
- "Measurements shall be made after the television has been in the off-mode for a minimum of 1 hour immediately followed by a minimum of 1 hour in the on-mode and shall be completed before a maximum of 3 hours in on-mode. The relevant video signal shall be displayed during the entire on-mode duration. For televisions that are known to stabilise within 1 hour, these durations may be reduced if the resulting measurement can be shown to be within 2% of the results that would otherwise be achieved using the durations described here".

2. On-mode power consumption

- “Measurements shall be made with an uncertainty of less than or equal to 2% at the 95% confidence level”.
- The Automatic Brightness Control (ABC) function shall be made inactive, if such function exists. If the ABC function is present and cannot be disabled, “the measurements shall be performed with the light entering directly into the ambient light sensor at a level of 300 lux, or more”.

Commission Regulation 642/2009 ANNEX III – Verification Procedure (Test Result / Compliance Margins)

According to ANNEX III, part 2 (a), the model is considered compliant, if the on-mode power consumption does not exceed the applicable limit set in Annex I, part 2 by more than 7%.

Commission Regulation 1062/2010 ANNEX VIII – Verification Procedure for Market Surveillance Purposes

According to ANNEX VIII, part 2 (a), the model is considered compliant, if the on-mode power consumption does not exceed the declared power consumption set in point 1 Annex II by more than 7%.

Within ComplianTV a product is considered to be compliant with the provisions set out in Commission Regulation 642/2009 ANNEX I and Commission Regulation 1062/2010 ANNEX II, if it fulfils the verification procedure and respective requirements of ANNEX III (Commission Regulation 642/2009) and ANNEX VIII (Commission Regulation 1062/2010), respectively.

2.2 Practical test issues

2.2.1 ComplianTV testing approach

- The measured power should be recorded during the measurement within 10 consecutive minutes.
- The measurement result should be documented in the final test report, under Clause 3.
- The graph of the test result should be documented in Appendix I in the final test report.

2. On-mode power consumption

- The on-mode power consumption of the television set is measured in out of the box condition, i.e. after the initial installation the settings of the television should not be changed, unless it is explicitly mentioned in the Regulation (e.g. turning off the ABC).
- Power measurements are made with an uncertainty of 2% at the 95% confidence level, as required in Regulation 642/2009 and in line with IEC62087:2011 Edition 2.0; Methods of measurement for the power consumption of audio, video and related equipment.
- Ambient and power measurement conditions should be verified and documented under Clause 1.1.3 Testing, Section “Ambient conditi-ons” of the final test report. Power measurement conditions relate to the stabilization of the on-mode power, which is considered stable when the difference in the measured power between the two readings is within 2%, as required in 642/2009.
- All settings and adjustments during the initial setup, on-mode conditi-on and the brightest condition should be documented in photographs and recorded in Appendix II of the final test report as shown in Figure 1 and Figure 2.

Figure 1: Factory brightness and contrast settings

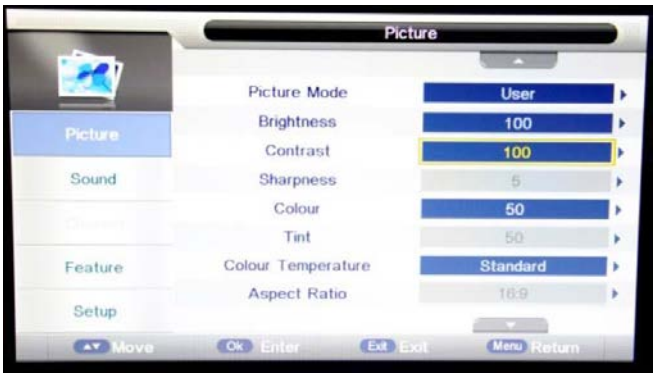


Figure 2: Adjustment of the brightest setting

2. On-mode power consumption

2.2.2 Issue – Automatic brightness control (ABC)

- The display of the television should be stabilised prior to testing by playing the dynamic broadcast-content video signal according to IEC 62087 “Methods of measurement for the power consumption of audio, video and related equipment”, edition 2 or edition 3, Clause 11.6. If the ABC function of the television is provided and enabled by default, it should be disabled.
- If the ABC function cannot be disabled, a minimum of 300 lux should enter the light sensor. ComplianTV found out that for some models the location of the ABC sensor was not easily identifiable. The incorrect sensor location may result in lower light intensity exposure, which in turn might result in lower power measurement.
- If the ABC sensor was not identifiable through visual inspection, ComplianTV ensured that the required light intensity enters the sensor after the following procedure:
  - The bezel of the television was covered and dimmed part by part by hand, while the ambient light intensity was held above 300 lux. The location of the ABS sensor is identified, when the luminance meter registers decrease in the television luminance.
- ComplianTV identified that the ABC sensor has not been named consistently and varies across the television brands, e.g. the ABC has been named as “eco sensor”, “light sensor” etc.

2.2.3 Issue – Power consumption increase related to volume settings

- ComplianTV identified that the volume setting has an impact on the power consumption. In particular, setting the speaker volume to a lower level at delivery or in “home mode” can result in considerably lower on-mode power consumption.
- A practical example has been obtained during the testing of on-mode power consumption of model “18A” (see Figure 3). With loudspeaker volume settings adjusted at “50”, the measured on-mode power amounted to 59.7 W exceeding the declared value of the energy label (52 W) settings (see Figure 3, model “18A”). The power measurement was performed again with volume settings set at “20”, which corresponds to the “out of the box” condition. The measured on-mode power with lower volume setting was in line with the declared values.

2. On-mode power consumption

- The standard IEC 62087, section 11, requires the sound level to be “audible” during the testing, which is subjective. In theory, this issue could be solved by specifying a quantified minimum sound level, which would be a requirement similar to the Ecodesign Regulation brightness setting requirements regarding the peak luminance ratio at delivery/”home mode”, in order to avoid a too dark (and less power consuming) setting by the manufacturer. However, from a practical point of view, there could be technical limitations because the testing procedure could be much more costly and difficult (additional equipment required) for laboratories, which could lead to a disproportionate approach.

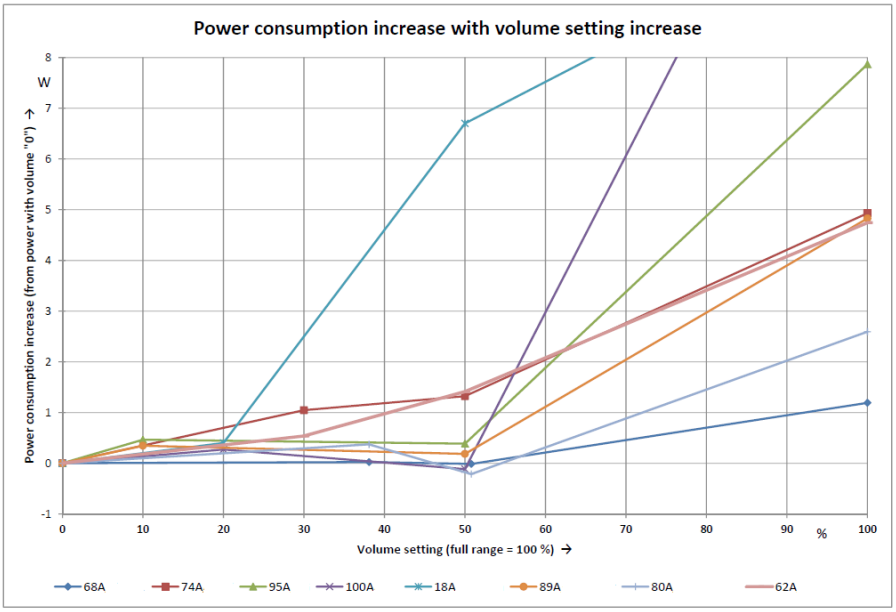


Figure 3: Power consumption reduction with volume setting increase

2.2.4 Issue – Dynamic in on-mode power consumption

- During the testing programme different load curves were measured in response to the “Dynamic Broadcast-Content Video Signal”. Figure 4 illustrates typical load curve while playing the dynamic broadcast--content video signal defined in IEC62087.

2. On-mode power consumption

Figure 5 illustrates new behaviour for on-mode power consumption, not previously experienced by the laboratory testing team. As an additional test, the on-mode power of the same television model was measured while introducing two different video signals (see Figure 6 and Figure 7). Identical behaviour of power reduction has been observed at the different measurement locations.

Note 1: The video signal of the three bar test pattern and of the dynamic broadcast-content are transferred to the television set from a DVD player via HDMI interface.
Note: The observed different load curves during the measurements raised the issue of the possibility of the TV to detect a test procedure and adapt its power consumption accordingly. Such phenomenon was not proven within the ComplianTV tests, but some tested televisions gave the impression that they detect a test situation, especially while displaying the "Dynamic Broadcast-Content Video Signal" and reduce energy consumption in order to achieve better test results. To avoid any loophole, this issue (ability of televisions to detect test situations) should be tackled within the draft Ecodesign Regulation, by forbidding such functionality, clearly against the spirit of the Regulation. The draft Ecodesign Regulation already takes this recommendation into account under Annex V, point 17:

"A display automatically recognising a situation of on-going compliance test and reacting to it to achieve a different result, in any of the verification points from 1 to 10, has do be considered not compliant."

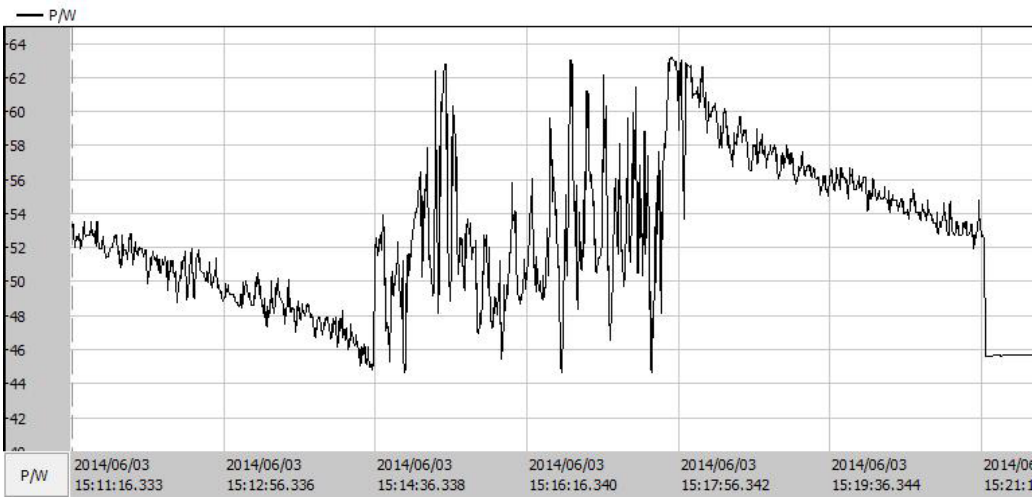


Figure 4: Typical load curve of on-mode power consumption

2. On-mode power consumption

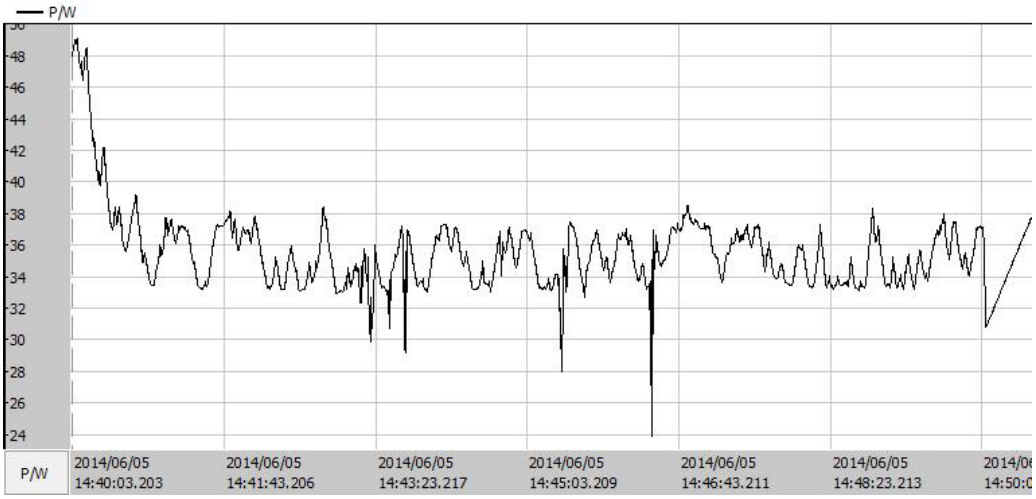


Figure 5: Untypical behaviour of the on-mode load curve

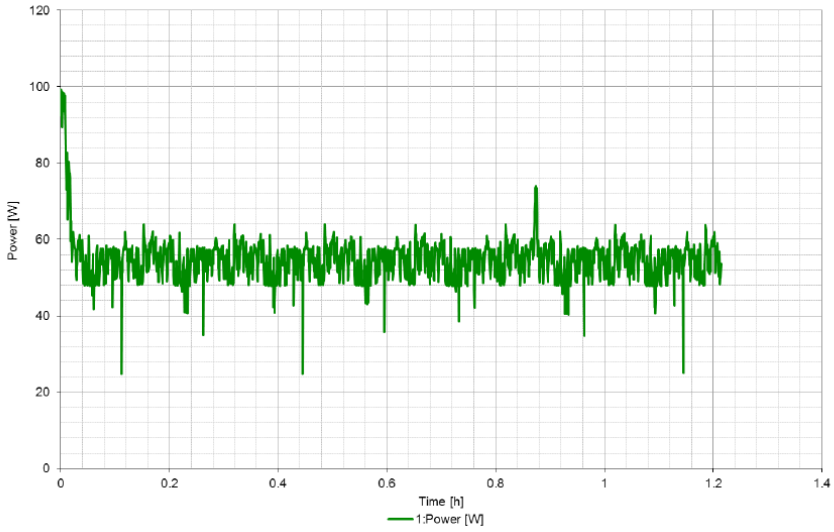


Figure 6: Power consumption load curve (dynamic broadcast-content video signal)

2. On-mode power consumption

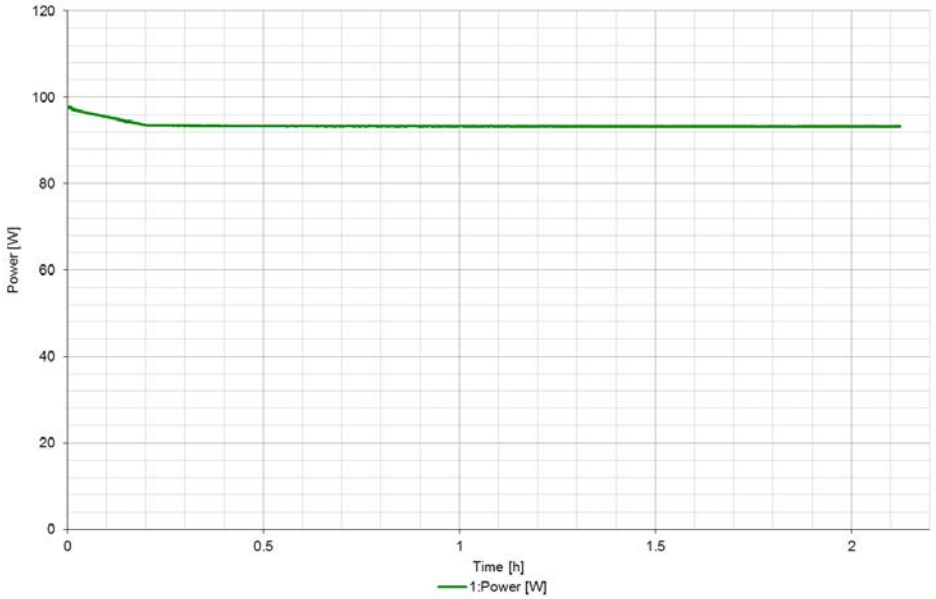


Figure 7: Power consumption load curve (three bar signal)

2.3 Lessons learnt and recommendations for best practice

- Install the television with the default values; i.e. in out of the box condition (for further details see the general conditions referred in IEC 62087).
- The identification of the ABC sensor is essential for the correct power measurement. Therefore, the location of the ABC sensor should be carefully verified.
- Determine if an ABC is present and if it is enabled by default. If the ABC is enabled by default, it should be disabled. If the ABC function cannot be disabled, ensure that minimum 300 lux enter the light sensor.
  - If the ABC sensor is not identifiable through visual inspection, the bezel of the television should be covered and dimmed part by part by hand, while the ambient light intensity was held above 300 lux. The location of the ABC sensor is identified, when the luminance meter registers decrease in the television luminance.
- Let the display of the television stabilise while playing the dynamic broadcast-content video signal according to IEC 62087 “Methods of measurement for the power consumption of audio, video and related equipment”, edition 2 or edition 3, Clause 11.6.

2. On-mode power consumption

- Take a measurement of 10 consecutive minutes according to IEC 62087 edition 2 or edition 3, Clause 11.6.
- Document in photographs the television settings adjusted in “out of the box” condition and the measurement result. Record both in the final test report.
- Note 1: The calibration of the measurement meters is a general recommendation for the accuracy of the testing.

3. Standby / Off-mode power consumption

3.1 Specifications according to Commission Regulation 642/2009 and to Commission Regulation 1062/2010

ANNEX I – Ecodesign Requirements

- According to ANNEX I, part 2, 2 (a), “the power consumption of TV in any “off-mode” shall not exceed 0.30 Watts”.
- The Regulation makes an exception for televisions “with an easily visible switch, which puts the television in a condition with power consumption not exceeding 0.01 Watts when operated to the off position, the power consumption of any other off-mode condition of the television shall not exceed 0.50 Watts”.
- According to ANNEX I, part 2 2, (b), the standby power consumption of televisions, which provide “only a reactivation function and a mere indication of enabled reactivation function shall not exceed 0.50 Watts“.
- According to ANNEX I, part 2 2, (b) “The power consumption of televisions in any condition providing only information or status display, or providing only a combination of reactivation function and information or status display, shall not exceed 1,00 Watt”.

ANNEX II – Measurement (Test Procedures)

- According to ANNEX II, part 2 (a), the power consumption “shall be measured by a reliable, accurate and reproducible measurement procedure”, with reference to EN 50564.
- According to ANNEX II, part 2 (b) “Measurements of power of 0.50 Watts or greater shall be made with an uncertainty of less than or equal to 2% at the 95% confidence level. Measurements of power of less than 0.50 Watt shall be made with an uncertainty of less than or equal to 0,01 Watt at the 95% confidence level”.

Commission Regulation 642/2009 ANNEX III – Verification Procedure (Test Result / Compliance Margins)

- According to ANNEX III, part 2 (b), a model is considered to comply with the provisions set out in ANNEX I, if the results of the off-mode/standby measurements do not exceed the applicable limit by more than 0.10 Watt.

3. Standby / Off-mode power consumption

Commission Regulation 1062/2010 ANNEX VIII - Verification procedure for market surveillance purposes

- According to ANNEX VIII, part 2 (b), a model is considered to comply with the provisions set out in ANNEX III, point 1 (g) if the results of the off-mode/standby measurements do not exceed the declared values by more than 0.10 Watt.

Within ComplianTV a product is considered to be compliant with the provisions set out in the Commission Regulation 642/2009 ANNEX I and Commission Regulation 1062/2010, ANNEX III, point 1(g), if it fulfils the verification procedure and respective requirements of ANNEX III, part 2 (b) and of ANNEX VIII, part 2 (b), respectively.

3.2 Practical test issues

3.2.1 ComplianTV testing approach

- The standby mode is selected or programmed by selecting the ”OFF” button with the remote control.
- The television set should be in stable working conditions as required in EN 50564:2011. ComplianTV measures power consumption in standby mode and or off-mode according to EN 50564:2011.
- Standby and or off-mode power measurements are made with an uncertainty of 0.01 W at the 95% confidence level, in accordance to Commission Regulation 642/2009.
- By reading the declared values it should be determined whether the television has a standby and or off-mode.

3.2.2 Issue

- ComplianTV did not identify issues related to the measurement of standby power consumption.

3. Standby / Off-mode power consumption

3.3 Lessons learnt and recommendations for best practice

- The procedure for television stabilisation provided in EN 50564:2011 should be considered for the standby/off mode power measurement.

4. Home mode

4.1 Specifications according to the Commission Regulation No 642/2009

ANNEX I – Ecodesign Requirements

- According to ANNEX I, point 3, television sets, which are delivered with “a forced menu on initial activation of the television shall provide a “home-mode” in the forced menu, which shall be the default choice on initial activation of the television. If the user selects a mode other than “home mode” on initial activation of the television, a second selection process shall be prompted to confirm this choice”.

4.2 Practical test issues

4.2.1 ComplianTV testing approach

- ComplianTV verifies by checking the menu (setting), if the “home-mode” is available upon initial activation and if it is set as a default choice (see Figure 8).
- If a different mode than the “home mode” can be selected, a second selection process should be initiated for confirmation of the selected mode (see Figure 9).
- The result of the verification process is documented in Clause 5 in the final test report.
- The verification of the “home mode” should be documented in photographs and recorded in Annex II of the test template.

4. Home mode

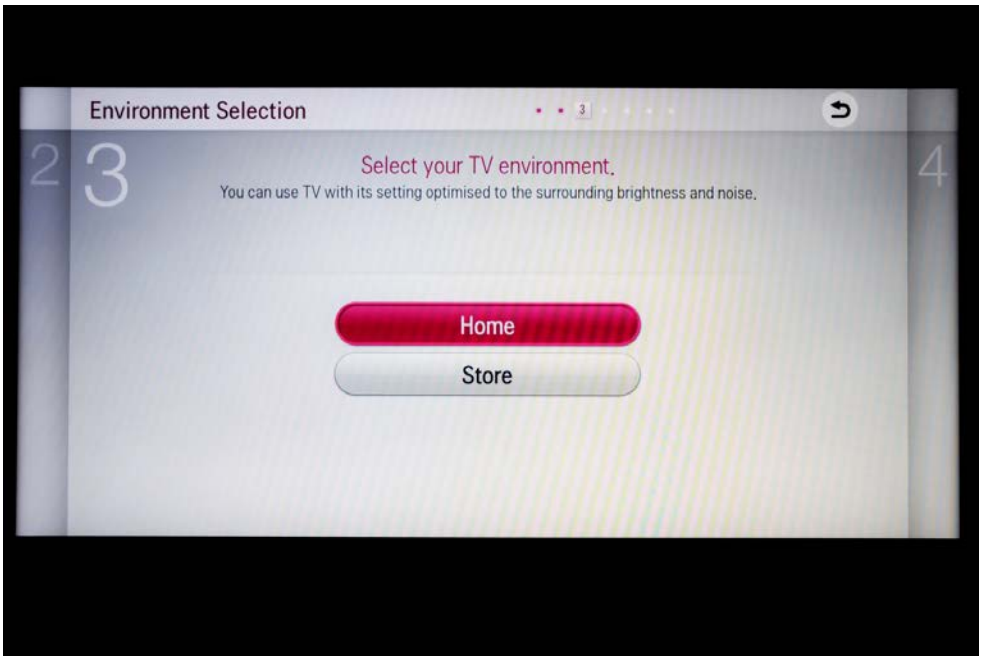


Figure 8: “Home-mode” selection upon television initial activation

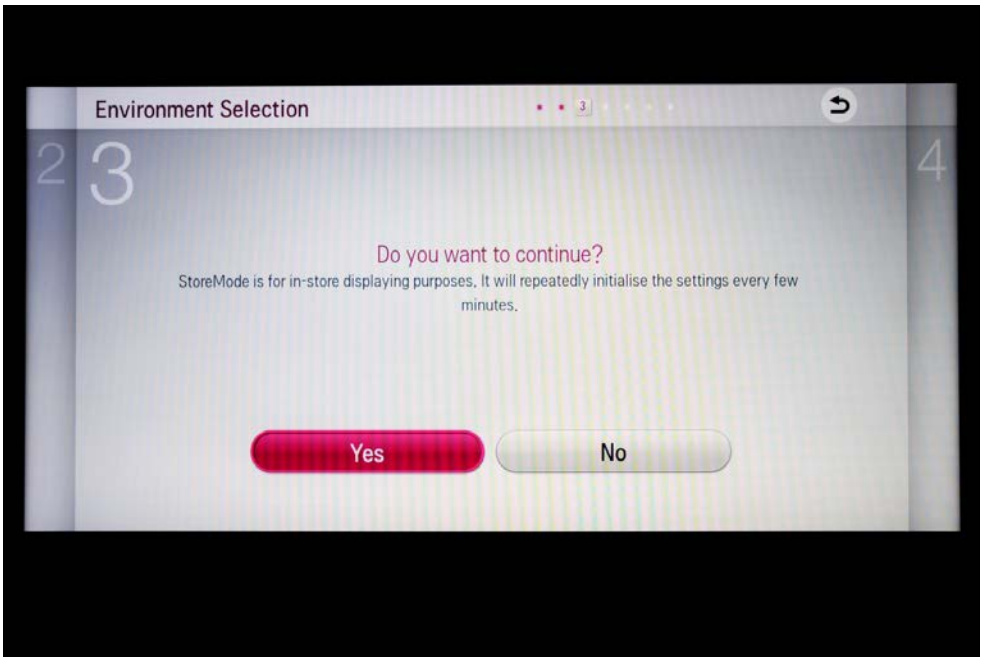


Figure 9: Second selection process for confirmation of the assigned mode

4.2.2 Issue

- ComplianTV did not identify issues related to the verification procedure of the “home mode”.

4.3 Lessons learnt and recommendations for best practice

- Initiate documentation in photographs of the first installation and menu parameters regarding the “home-mode”. The photographs should be recorded in Appendix II in the final test report.

5. Automatic power down (APD)

5.1 Specifications according to the Commission Regulation No 642/2009

ANNEX I – Ecodesign Requirements

According to Annex I, part 2, 2 (d/i), the APD is stipulated as follows:

- "after no more than 4 hours in on-mode following the last user interaction and/or a channel change, the television shall be automatically switched from on-mode to:
- standby-mode, or,
- off-mode, or,
- another condition which does not exceed the applicable power consumption requirements for off-mode and/or standby-mode";

In addition, part 2, 2 (d/ii) defines that "televisions shall display an alert message before the automatic switch from on mode to the applicable condition/modes. This function shall be set as default".

A product is considered compliant when it fulfils the provisions set out in ANNEX I, part 2, 2 d (i) and part 2, 2 d (ii).

Note 1: In the absence of any official guidance, ComplianTV considers 1 minute as an adequate time tolerance for the specified value of 4 hours for the required APD.

Note 2: Annex I, part 2, 2 (d/i) is not clear enough in its wording and offers room for interpretations. In particular, the Regulation wording "the television shall be automatically switched from on-mode" to low power state may refer to the start of the APD event (i.e. the process should start before 4 hours) or to the end of the APD event (i.e. the television has fully reached a low power state, before 4h). Furthermore, the Regulation does not provide guidance on the duration of the transition phase from on-mode to standby/off-mode. The duration definition of the transition phase is of relevance because the APD event is not instantaneous, and may take some time (see Figure 11).

In the absence of any official guidance, ComplianTV verifies that the television starts switching to low power state after no more than 4 hours. In addition, ComplianTV verifies whether the television has reached low power state after the APD event.

5. Automatic power down (APD)

Note 3: The Ecodesign draft Regulation, Annex II, point 3 covers the above-mentioned recommendation by specifying the time frame for the television to reach a low power state:

> *"within 4 hours in on mode following the last end-user interaction and/or at the end of an on-going function that may extend beyond the 4 hour window (e.g. recording) the electronic display shall complete an automatic switch from on mode standby mode, or, off mode, or, another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode".*

- The ComplianTV consortium acknowledges that the chosen option (transition phase considered within the 4 hours) appears as the most relevant one, from the testing procedure point of view.

5.2 Practical test issues

5.2.1 ComplianTV testing approach

- The television should be energised (i.e. in on-mode) prior the APD test for not less than 15 minutes, as specified in EN 50564:2011.
- ComplianTV records the last interaction with the television. For instance, the last interaction with the television might be performed by pressing the mute button or reducing the loudspeaker volume from the remote control. From that moment, an interaction with the television should not be undertaken. The period up to the APD event and standby/off-mode should be recorded.
  Note 1: The release of the remote control button is the starting point of the ADP measurement.
- For the measurement of APD, ComplianTV applies a continuous video signal with duration of more than 4 hours.
- In addition to the APD availability and in accordance to the requirements, ComplianTV declares a product compliant when the APD is activated as a default setting when the unit is taken out of the box.
- Compliant TV rates tested products as passing the APD requirement, if the television starts switching into standby-mode, off-mode or another condition (which does not exceed the applicable power consumption requirements for off-mode and/or standby-mode) after no more than 4 hours and 1 minute.

5. Automatic power down (APD)

- The result from the APD measurement should be documented in Clause 4 (d/i) in the final test report.
- The appearance of the alert message prior the APD event should be documented in Clause 4 (d/ii) in the final test report.
- A photograph of the appearance of the alert message should be documented and recorded in Appendix II in the final test report (see Figure 13).
- If required, an additional power meter with high resolution should be used in order to confirm that the television has reached the standby or off-mode.

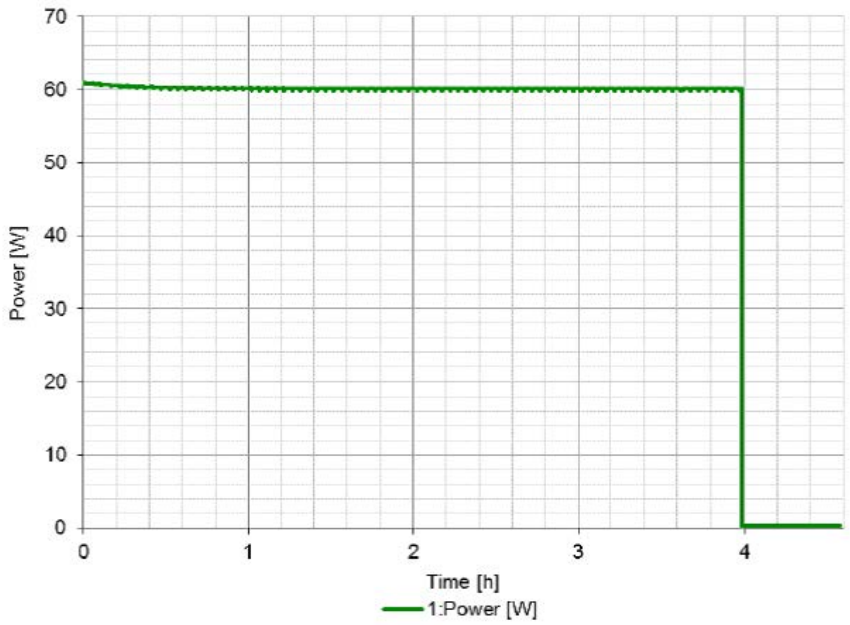


Figure 10: APD event occurring within the stipulated time frame (03:59:13 h)

- Figure 11 illustrates the transition phase of the television during the switching from “on-mode” to “standby” mode. The horizontal axis of the diagram is divided in 5 seconds intervals. As shown, the regarded model switches from 28 W to 4 W in 1 second. The power consumption level remains for 5 seconds at 4 W, afterwards the model switches in 1 second to 0.42 W, which is within the stipulated values for standby power.

5. Automatic power down (APD)

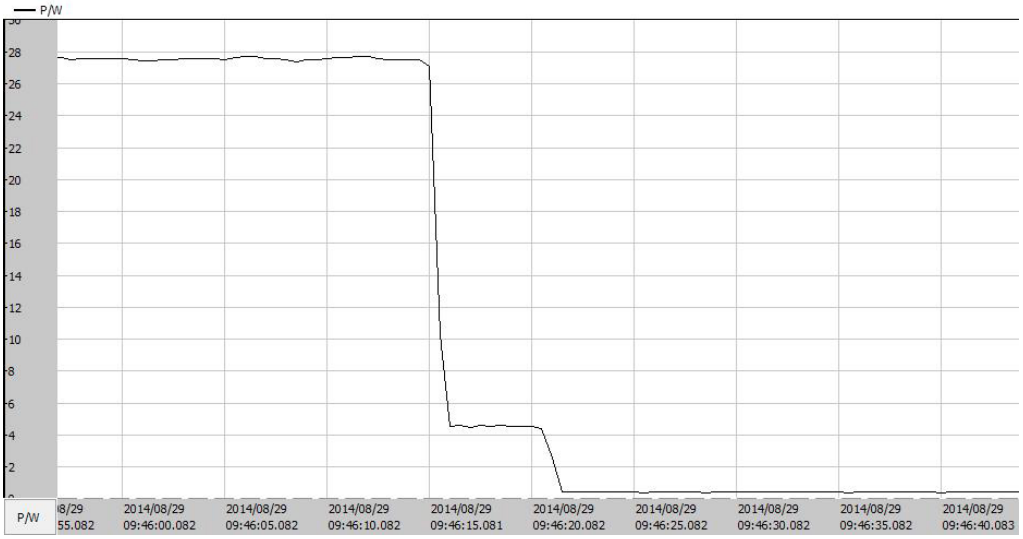


Figure 11: Television switching from on-mode to standby mode (APD)

- Figure 12 illustrates a case where the APD occurs after the stipulated time frame of the APD event; therefore the model should be regarded as non-compliant.

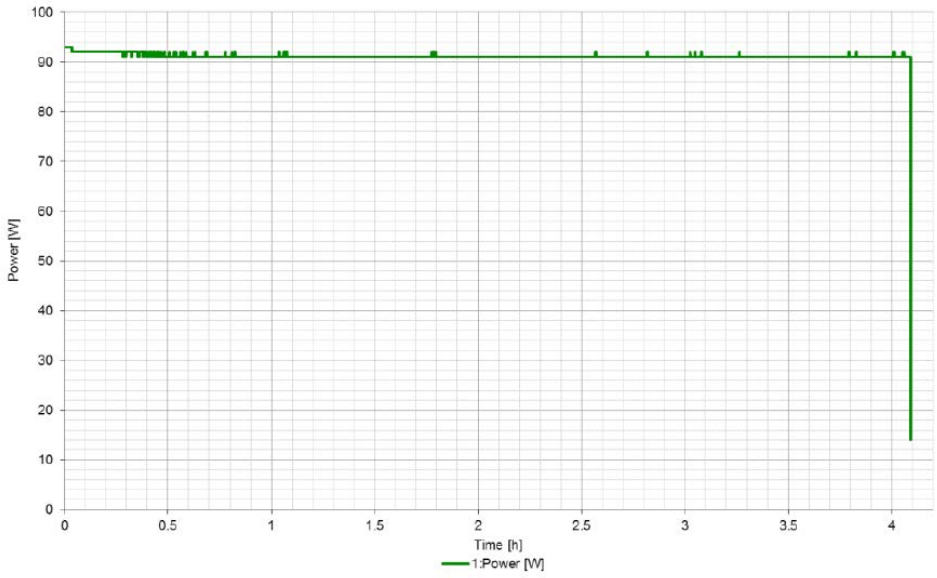


Figure 12: APD event occurring beyond the stipulated time frame (04:05:35 h)

5. Automatic power down (APD)

- Figure 13 illustrates the appearance of the alert message prior the APD event.

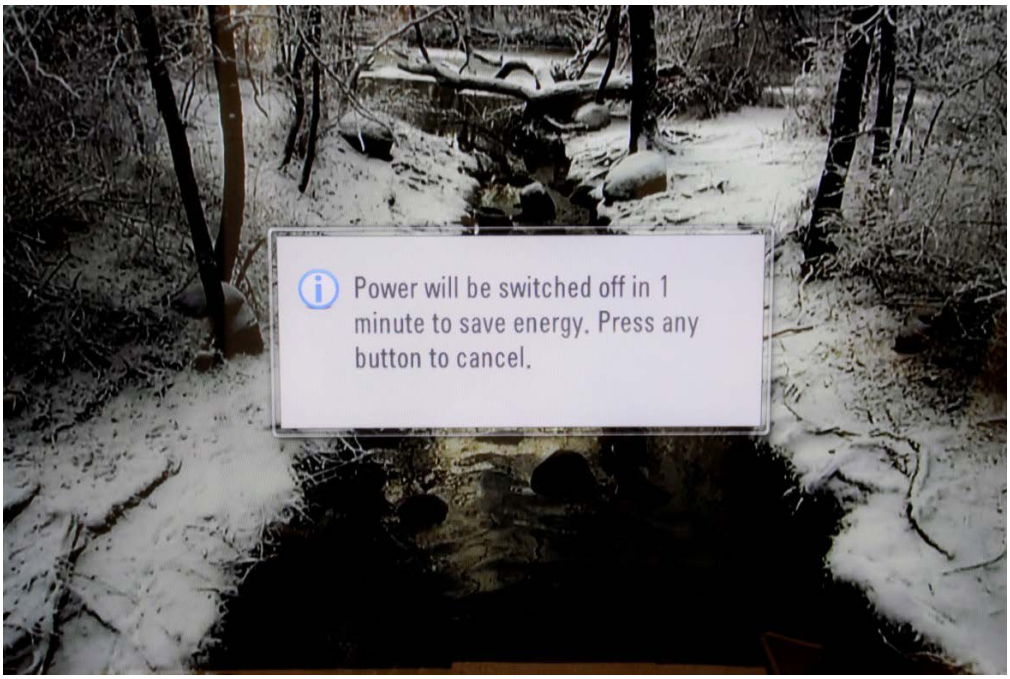


Figure 13: Alert message prior the APD event

5. Automatic power down (APD)

5.2.2 Issue – Last user interaction

- Possible mistakes in the APD measurement might occur, if the moment of the last user interaction is not timed correctly. The television should have been in on-mode for at least 15 minutes when the last interaction is undertaken. The APD measurement should be initiated at this point.

5.3 Lessons learnt and recommendations for best practice

- The television has to be in on-mode for at least 15 minutes before the last user interaction is recorded.
- Television should be restored to its primary settings as upon initial activation.
- Last user interaction should be recorded after the television has been for at least 15 minutes in on-mode, e.g. by pressing the mute button or reducing the speaker volume settings from the remote control; the release of the remote control button should be the starting point of the measurement.
- Television should be in on-mode by playing a continuous input signal, e.g. the dynamic broadcast-content video signal.
  Note: There is no guidance on the video signal to be used during the 4h prior the APD.
- The alert message just before the television automatically switches down should be recorded by taking a picture of the screen.
- If the standby power was not reached a further test with power recording should be done to find out the exact behaviour during the power down switching.
- If required, an additional power meter with sufficient resolution should be used in order to confirm that the television is indeed in standby or off-mode.

6. Peak Luminance Ratio (PLR)

6.1 Specifications according to the Commission Regulation No 642/2009

ANNEX I – Ecodesign Requirements

According to ANNEX I, part 4 states with respect to the testing of PLR:

- "Televisions without forced menu: the peak luminance of the on-mode condition of the television as delivered by the manufacturer shall not be less than 65 % of the peak luminance of the brightest on-mode condition provided by the television".
- "Televisions with forced menu: the peak luminance of the home-mode condition shall not be less than 65 % of the peak luminance of the brightest on-mode condition provided by the television".

ANNEX II – Measurement (Test Procedures)

According to ANNEX II, part 3:

- "Measurements shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods".
- "Measurements of peak luminance shall be made with a luminance meter, detecting that portion of the screen exhibiting a full (100%) white image, which is part of a 'full screen test' test pattern that does not exceed the average picture level (APL) point where any power limiting occurs in the display luminance drive system".
- "Measurements of luminance ratio shall be made without disturbing the luminance meter's detection point on the display whilst switching between the conditions referred to in Annex I, Part 4".

ANNEX III – Verification Procedure

- According to the ANNEX III, part 2 (c), when performing the market surveillance checks a model is considered to comply with the provisions set out in ANNEX I, if "the result for the peak luminance ratio set out in ANNEX I, part 3 does not fall below 60 %".
  Note: ANNEX I, part 3 refers to the "'home mode' for televisions which are delivered with a forced menu", which is a wrong reference. The correct reference should be ANNEX I, part 4 "Peak Luminance Ratio".

6. Peak Luminance Ratio (PLR)

- For the PLR test, the ComplianTV consortium considers the PLR threshold of 60 %. This procedure is in line with the requirements defined in the Commission Regulation 642/2009 concerning MSAs as well as the common practice among MSAs.
- A product is considered to comply with the provisions set out in ANNEX I, if it fulfils the verification procedure and respective requirements of ANNEX III, part 2 (c).

6.2 Practical test issues

6.2.1 ComplianTV testing approach

- In order to define the PLR, the test lab should verify whether “shop mode” can be manually adjusted into a brighter setting or not and ensure that the product setting is adjusted to the brightest mode.
- This setting shall be documented in Clause 6 of the final test report.
- In order to achieve the brightest setting, the test lab might adjust all available pre-settings, including “home mode” and “shop mode”.
- If the brightness can be manually adjusted to a brighter setting in “shop mode”, the manufacturer will be informed that an adjustable “shop mode” exists, which is contradictory to the guidance[5], but which is not legally binding. Therefore, this will not have any influence on the compliance status of the television.
- Luminance ratio is measured by applying the three-bar signal specified in IEC 62087 edition 2.0, Section 11.5.5 (three bars of white [100 %] over a black [0 %] background) for LCD televisions with full or edge LED backlighting.
- For plasma televisions, the luminance ratio is measured by applying a 4 % white area, specified in the ICDM version 1.03b (Figure 14).

5 Guidelines accompanying Commission Regulation (EC) No 642/2009 of 22 July 2009 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for televisions, available at: http://ec.europa.eu/energy/efficiency/ecodesign/doc/regulations/guidelines_ecodesign_televisions_may_2011.pdf

6. Peak Luminance Ratio (PLR)

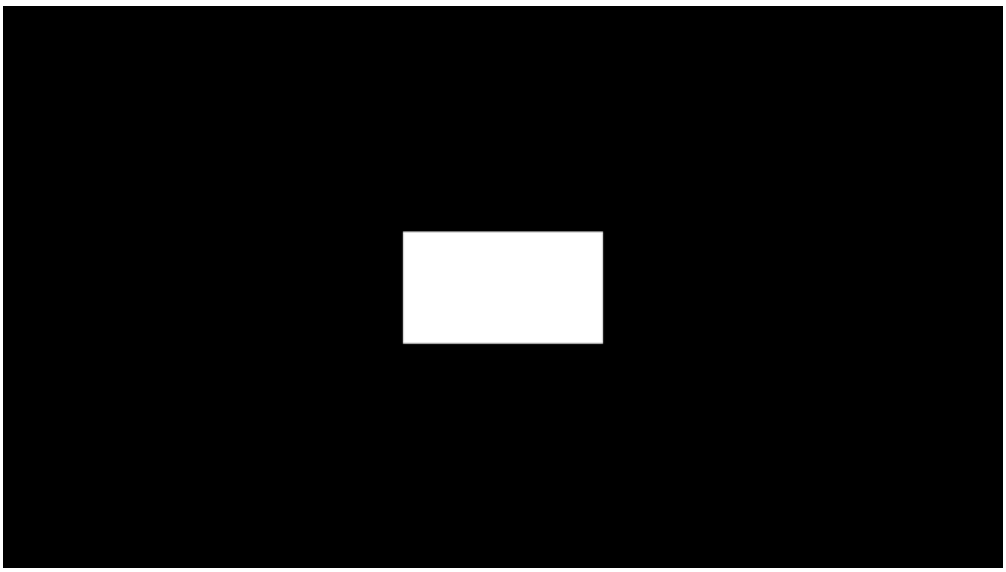


Figure 14: 4 % white test pattern for PLR measurement of plasma televisions

- In case of non-compliance after the PLR test with the three bar test pattern, the manufacturer may provide information on the PLR testing procedure and the used test pattern. The suggested test pattern should be verified for any power limiting and then applied for the PLR measurement. If there is evidence of power limiting in the suggested/ used by the manufacturer test pattern, ComplianTV uses the three bar test pattern.
- For the PLR test, the ComplianTV consortium considers the PLR threshold of 60 %. This procedure is in line with the requirements defined in the Commission Regulation 642/2009 concerning MSAs as well as the common practice among MSAs.
- In order to determine the centre of the screen, ComplianTV applies a test image of 1.2 % or 4 % white image area. The luminance sensor should be placed in the centre of the white box according to the ICDM Information Display Measurements Standard (IDMS1), version 1.03 a, Section 3.2.
- Depending on the luminance sensor used for the luminance measurement, the required distance between the luminance sensor and the screen might vary. For instance, ComplianTV uses, among others, the luminance sensor Konica Minolta CA-210, which requires 30mm distance from the screen.
- The results of the PLR test are documented in Clause 6 of the final test report.

6. Peak Luminance Ratio (PLR)

6.2.2 Issue – Value of the PLR/ Ambiguity in Regulation No 642/2009

- The Commission Regulation (EC) No 642/2009 sets two different ratios with respect to the testing of peak luminance – ANNEX I, part 4 defines a minimum of 65 % PLR, whereas ANNEX III, part 2 (c) requires that the PLR does not fall below 60 %.

6.3 Lessons learnt and recommendations for best practice

- The luminance sensor should be installed in the centre of the screen (100 % white image area entering the sensor) with a tolerance of +/-25 mm.
- At first, the luminance value for “home-mode” or for the factory settings should be determined. All relevant settings influencing the luminance should be documented.
- Secondly, the brightest on-mode condition provided by the television should be determined by adjusting the relevant parameters, e.g. backlighting, brightness, sharpness and contrast. The final settings used for the test should be documented in photographs and recorded in Appendix II in the final test report.[6]
- To ensure comparable test conditions across all models and brands, a definition of a unified test pattern for PLR would be beneficial. Moreover, a harmonised test pattern (without the possibility of having different PLR results by manufacturers depending on the test pattern used) would improve the comparability of television testing and market surveillance activities.
- In case the PLR is measured with additional test pattern provided by the manufacturer, the ComplianTV project recommends connecting the USB stick containing the test pattern not directly to the television but to the USB input of the player. That way the same input level can be ensured as when measuring with the standard three bar test pattern (introduced via DVD/Blu-ray player).

6 The „brightest on-mode condition“ is the product’s maximum luminance that can be provided by the television when „manually“ adjusting the relevant picture settings while maintaining optimum picture contrast as tested using relevant gray-scale test patterns, Guidelines accompanying Commission Regulation (EU) No 642/2009, May 2011, https://ec.europa.eu/energy/sites/ener/files/documents/guidelines_ecodesign_televisions_may_2011.pdf

6. Peak Luminance Ratio (PLR)

- Note: The calibration of the measurement meters is a general recommendation for the accuracy of the testing.

7. EEI and Annual Power Consumption

7.1 Specifications according to the Commission Regulation No 1062/2010

ANNEX II - Method for Calculating the Energy Efficiency Index and the Annual On-mode Energy Consumption

According to Annex II, part 1 the Energy Efficiency Index (EEI) is calculated as EEI = P/P_{ref} (A), where:

- P_{ref} (A) = P_{basic} + A × 4,3224 Watts/dm2,
- P_{basic} = 20 Watts for television sets with one tuner/receiver and no hard disc,
- P_{basic} = 24 Watts for television sets with two or more tuners/receivers,
- P_{basic} = 28 Watts for television sets with hard disc(s) and two or more tuners/receivers,
- A is the visible screen area expressed in dm2,
- P is the on-mode power consumption of the television in Watts measured in accordance with Annex VII, rounded to one decimal place.

According to ANNEX II, part 2, the annual on-mode energy consumption E in kWh is calculated as E = 1,46 × P.

According to ANNEX II, part 3, the EEI and the annual on-mode energy consumption measured corresponding to the procedure set out in Annex VII can be reduced by 5 %, if the following conditions are fulfilled when the television is placed on the market:

- (a) the luminance of the television in the home-mode or the on-mode condition as set by the supplier, is automatically reduced between an ambient light intensity of at least 20 lux and 0 lux.
- (b) the automatic brightness control is activated in the home-mode condition or the on-mode condition of the television as set by the supplier.

ANNEX VII – Measurements (Test Procedure)

See section 2.1 of this document.

7. EEI and Annual Power Consumption

7.2 Practical test issues

7.2.1 ComplianTV testing approach

- In order to verify whether the television automatically reduces the luminance by decreasing ambient light intensity, a lamp with variable brightness is set near to the ABC sensor of the television in order to achieve luminance intensity between 200 lux and 100 lux, while the luminance sensor on the screen measures the screen luminance.
- The lamp brightness is reduced to about 0 lux and the luminance values are reported. If the television reduces the luminance, the EEI and the annual on-mode power consumption will be reduced by 5 %, according to Regulation 1062/2010, ANNEX II, part 3.

7.2.2 Issue - Calculation of EEI

- The Commission Regulation (EC) No 1062/2010 defines the calculation of the EEI according to the specifications of the television, such as tuner availability. At this point, the availability of two or more tuners/receivers is of particular relevance. Nevertheless, the Regulation text does not provide a definition of two or more tuners/receivers.
- In the absence of any official guidance on how to define two or more tuners ComplianTV considers the definition developed as a result of the ADCO[7] meeting, which corresponds to the definition provided in Commission Regulation (EC) No 107/2009[8] as well. Accordingly, the definition of “two or more tuners/receivers” depends upon the functionality of the television rather than the physical number of tuning devices that are contained inside the television. Therefore, if the television has the ability to decode two or more streams of television broadcast even if both streams are decoded by the same physical tuning device, it will be regarded as a device with two or more tuners/receivers.[9]

Note: The draft Energy Label Regulation, Annex III, point 1 defines a single fixed value for the P_{basic} equivalent value (20 W) for all kind of televisions, whatever the number of tuners. In that case, the definition of one vs. multiple tuners is not required anymore.

7 Minutes of the ADCO meeting available at: http://www.erp-richtlinie.at/fileadmin/eup/docs/FAQs_Ecodesign.pdf

8 Commission Regulation (EC) No 107/2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for simple set-top boxes

9 Energy Efficiency Labelling for Televisions, A guide to the Commission Delegated Regulation (EU), 1062/2010; DigitalEurope 2012.

7. EEI and Annual Power Consumption

- ComplianTV accepted all tested appliances having an ABC to fulfil the Regulation requirement. Accordingly, the annual on-mode power consumption was reduced by 5 %. However, the Regulation text is not clear on defining the reduction of ambient light intensity. In Annex II, 3. (a), the text is as follows: “the luminance of the television…, is automatically reduced between an ambient light intensity of at least 20 lux and 0 lux”. This can mean that a luminance reduction between any value of the ambient light intensity over 20 lux and a value under 20 lux is acceptable.

7.3 Lessons learnt and recommendations for best practice

- In order to illustrate the behaviour of the televisions, ComplianTV depicted the luminance variation depending on the ambient light intensity. Figure 15 illustrates the results from the luminance test. As it can be seen, by reduction of the light intensity the models with code 21, 24, 30 and 98 decrease steadily the luminance. These four models are proper examples, considering reduction of energy by luminance reduction and adapting the brightness for the user’s eyes.

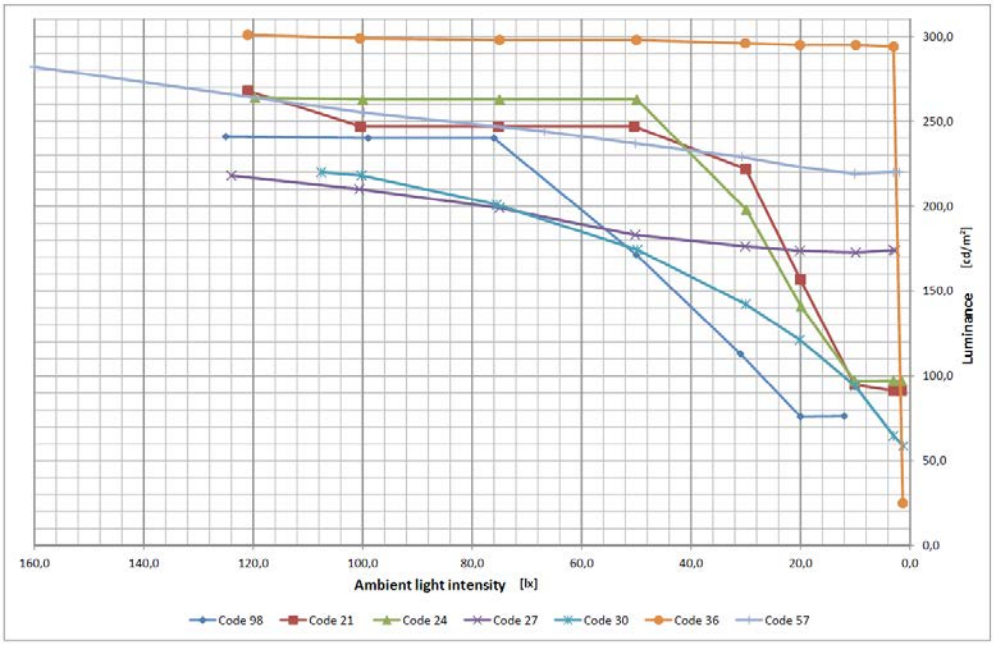


Figure 15: Luminance of different TV screens with changing ambient light intensity

7. EEI and Annual Power Consumption

- The model with code 36 reduces the luminance in the range between 20 lux and 0 lux abruptly. This model would be a candidate to fail the requirements not only due to the negligible difference of luminance reduction between 120 and 20 lux, but also due to the luminance reduction starting well below the limit (at least 20 lux). Additionally, such an extreme luminance change may be annoying for the user.
- The models with codes 27 and 57 have nearly no change between 20 lux and 0 lux, and generally only a small reduction from bright to completely dark surrounding. From energy saving perspective, the decrease of the luminance is negligible.
- The ABC should be enabled by default; otherwise the television will not receive the bonus. The luminance level should be measured with the default settings of the television, applying the three bar video signal specified in IEC 62087 Ed. 2.0, Section 11.5.5. Firstly, luminance is measured by a light level of 0 lux entering the ABC and secondly, the luminance is measured by a light level of 300 lux positioned in front of the ABC sensor.
- If the luminance level measured at 0 lux is lower than at 300 lux 5 % bonus is applied for the calculation of EEI and the annual on-mode power consumption.

8. Information requirements

The laboratory testing of the technical ecodesign requirements described in the sections above provide the first indication of the compliance of that model. In addition, under the ComplianTV project the unit tested is considered compliant when the following information requirements are fulfilled:

- Requirements addressing the publicly available information provided on free-access websites as defined by EU Ecodesign Regulation No 642/2009, Annex I, point 5, section 2.
- Requirements addressing the product fiche as defined by the EU Energy Labelling Regulation for TVs No 1062/2010, Annex III.

9. Measurement uncertainty and tolerances

9.1 On-mode power consumption

- On-mode power measurements are made with an uncertainty required in 642/2009, respectively in IEC 62087 edition 2 or edition 3.
- According to Commission Regulation 642/2009 Annex III, 2. (a) a tolerance of 7 % from the applicable limit is accepted for on-mode power limit, which is in line with the requirements for the market surveillance checks.
- According to Commission Regulation 1062/2010 Annex VIII, 2. (a) a tolerance of 7 % from the declared values is accepted for on-mode power limit, which is in line with the requirements for the market surveillance checks.

9.2 Standby / Off-mode power consumption

- The measurement uncertainty is done according to Commission Regulation No. 642/2009 and Commission Regulation No. 1062/2010.
- According to Commission Regulation (EC) No 642/2009, within the market surveillance checks a tolerance of 0.1 W from the applicable limit is accepted for the standby power limit.
- According to Commission Regulation 1062/2010 Annex VIII, 2(b), within the market surveillance checks a tolerance of 0.1 W from the declared value is accepted for the standby power limit.

9.3 Automatic power down

- Within ComplianTV a time measurement tolerance of 1 minute is accepted for the specified value of 4 hours for the required APD.

9.4 Peak luminance ratio

- According to the ANNEX III VERIFICATION PROCEDURE 3 (c), the result for the PLR should not fall below 60 %. For the PLR test, ComplianTV uses the market surveillance limits.

10. Optimisation of testing time efficiency

Optimisation of television testing aims at enhancing the time efficiency of the process, especially when inspection of small volume of television units is carried out. Figure 16 suggests a testing sequence, which takes into account the measurement requirements set in Commission Regulation 642/2009, IEC 62087: “Methods of measurement for the power consumption of audio, video and related equipment”, edition 2 or edition 3 and EN 50564:2011: “Electrical and electronic household and office equipment. Measurement of low power consumption”.

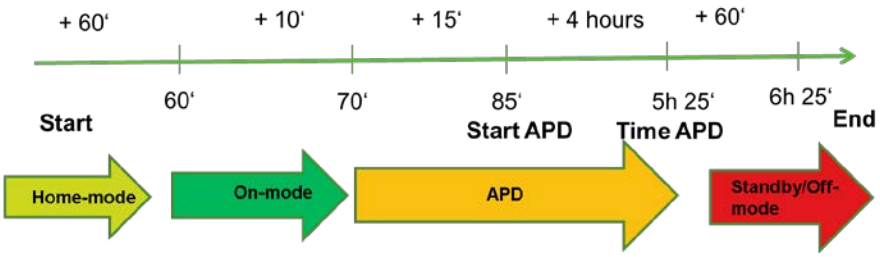


Figure 16: Sequence of television testing

- Start: the verification of home-mode constitutes the starting point of the testing.
- + 60 minutes: For the on-mode power measurement, the television is stabilized within the next 1 hour according to Commission Regulation 642/2009 on-mode power measurement.
- + 10 minutes: Measurement of on-mode power consumption - the measurement is the average power consumed over 10 consecutive minutes while displaying the dynamic broadcast-content video.+ 15 minutes: For the APD testing, the television should be in on-mode at least 15 minutes. Last user interaction could be the switching to the dynamic broadcast-content video.
- + 4 hours: No interaction with the television, a continuous video signal is displayed within this time frame.
- After 5 hours and 25 minutes: After 4 hours without an interaction with the television the presence of alert message notifying the APD, timing the APD event and low power measurement is carried out.
- + 1 hour: the television remains for at 1 hour in standby/off-mode
- After 6 hours and 25 minutes: Standby/off-mode power measurement is carried out.

10. Optimisation of testing time efficiency

The verification of the home-mode requirement and measurement of on--mode power consumption, APD and standby/off-mode power consumption can be performed for approximately 7 hours. PLR measurement is carried out in a separate step, depending on the test laboratory settings.

Note 1: ComplianTV considers 1 minute as time tolerance for the specified value of 4 hours for the required APD. However, Figure 16 takes into account the Ecodesign draft Regulation, Annex II, point 3, which stipulates the timing of the APD event and does not consider the tolerance agreed under the ComplianTV project.

11. Product selection strategy

Considering the large variety of television brands and models introduced continuously on the market, for MSAs it is essential to select carefully the products under test. There are different techniques and methods for the selection of products, depending on the specific purpose of the inspection. Within the Ecopliant project two main selection approaches are pointed out – the random or statistical based approach and the targeted approach, also known as risk-based sampling (see the guidelines elaborated within the Ecopliant project[10]).

ComplianTV followed two main approaches for the selection of television sets for the 1st and the 2nd batches, taking into account technical as well as economic criteria. Technical criteria include display size, display technology and display performance whereas the economic criteria refer to market share, manufacturer or brand share, typical price segment and availability on the market.

The approach obtained for the selection of the 1st batch puts emphasis on the "market representativeness" of the television sets, i.e. the focus has been placed on covering the representative products according to the European market shares in terms of unit sales (bestsellers). Therefore, a market analysis has been conducted based mainly on publicly available information provided by specialised market research institutions. In a next step, ComplianTV conducted its own online survey analysing the Amazon TOP 100 listings in UK, Germany, Spain, France and Italy to confirm the market data of the research institutions. The selection resulted in 60 television sets – 60 % A-brands and 40 % other brands[11]. All selected televisions had been placed on the market after February 2012, which is in line with the entry into force of Regulation No 1062/2010 for energy labelling of televisions.

For the 2nd batch, the selection approach was based on having a full spectrum of available products, covering the entire market with as many manufacturers (and distribution channels) as possible. In order to cover the diversity condition, the selection of television sets for the 2nd batch resulted in 40 television sets – 30 % A-brands and 70 % other brands placed after June 2013 on the market[12].

10 Guidelines for Coordinated and Effective Ecodesign Market Surveillance, D2.2 Draft Best Practice Guidelines, available at: http://www.ecopliant.eu/wp-content/uploads/2013/10/Draft-Best-Practice-Guidelines.pdf

11 Television market trends and classification of brands are addressed in Short market analysis on representative TVs (Deliverable 2.2,) available at: http://www.compliantv.eu/eu/about-the-project/all-documents/

12 The report on product selection methodology is available at: http://www.compliantv.eu/eu/about-the-project/all-documents/

11. Product selection strategy

The selection strategy obtained in the 3rd batch differs slightly from the strategy followed from the selection of the first 100 television models. Whereas the focus of the 1st and 2nd batches was mainly placed on market representativeness, in the 3rd batch the television display technologies and television functionalities, as well as aspects underrepresented in the previous two batches, such as declaration of high Energy Efficiency Classes were the main selection criteria.

In addition, GfK conducted an independent market survey on the availability of the preselected models on the European market. According to the survey, only television models sold in strictly more than 1 EU-28 country were selected.

In particular, 62 models that had entered the market after May 2014 were selected, taking into account the following principles:

- Brand - identification of TV brands not tested in the 1st and 2nd batch.
- Screen type and features – inclusion of OLED, models with edge and full LED backlighting system, 3D.
- Television features - selection of models with multiple tuner technology.
- Energy Efficiency Class – selection of low price segment models with high EEC declaration, e.g. EEC A+ and A++.
- Country availability - selection of models sold in strictly more than one EU-28 country.

For all batches, an even spread between 4 predefined screen size categories was ensured.

The initial purpose of ComplianTV was to cover TV sets as well as TV monitors. The current legislative framework for televisions (TVs) (Regulation (EU) No 642/2009 on Ecodesign requirements for televisions and Regulation (EU) No 1062/2010 on energy labelling of televisions) indeed differentiates between television sets and television monitors. The TV monitor category, as defined in the Regulations, focuses on specialised monitors that are mainly used in broadcast stations and video editing stations with a low market share. ComplianTV could not identify such products during the market analysis for consumer products, presented in Deliverable 2.2: Short market analysis on representative TVs. Therefore, ComplianTV regards TV sets as a product whose primary function is to receive and

11. Product selection strategy

display audio-visual signals. It consists of a display and at least one integrated tuner unit. Display products without an integrated tuner are not defined as a TV set in this project.

12. Disclaimer and a note on Terminology

The ComplianTV Project aims at providing a fully-fledged and detailed methodological guidance to allow EU Member State MSAs to face the new legislative and market challenges for televisions in an effective and cost-efficient way (with a support of aligned concerted testing and the development of a database). It should be noted that the testing results published by the ComplianTV Project are based only on the samples tested. These results are not legally binding and are without prejudice to any determination of compliance or non-compliance by a national MSA. In particular, they are not effective in law and cannot be used to declare if an appliance is compliant or non-compliant.

Only the MSAs of each Member State have the legal right to officially declare whether a television placed on the market is compliant or non-compliant and it is up to each Member State MSA within the EU to decide if actions are needed.

Within the ComplianTV project, the use of the term non-compliant refers only to a conformity check performed by the project against the requirements specified. It is not a formal MSA check. This terminology will be used under the circumstances where the television fails after step 1 testing, and the manufacturer has accepted the results, and also where the television fails after step 2 testing. The use of the term “suspected non--compliant” will be used in case the product has failed the step 1 testing and is still under test.

13. About ComplianTV

With the implementation of the legal framework for Ecodesign (Directive 2009/125/EC) and Energy Labelling (Directive 2010/30/EU), the EU has established powerful instruments to support market transformation towards more energy efficient products. In particular, TVs covered by both policy instruments, are now subjected to Ecodesign implementing measures (Regulation No 642/2009) and Energy Labelling requirements (Regulation No 1062/2010), aiming at pushing the market to higher energy efficiency products.

Ensuring that the requirements of the legislative framework are fulfilled in practice represents a key stake for the efficiency of these policies. However, almost all market information on energy efficiency of these products in the EU-28 is currently provided as self-declaration by manufacturers, as planned in the Ecodesign and Energy Labelling framework. So far, there has been very little standardised independent product testing and independent confirmation of correctness of the product information and market development, because market surveillance at national level has not been widely implemented. Activities assessing the availability of required product information in shops and in information media have also been largely missing.

In this context, the ComplianTV project brings together ten experienced organisations, including three testing laboratories, with the objective of assessing the compliance of televisions in the framework of these new Energy Labelling and Ecodesign regulations, through verification procedures. In doing so, the project will generate a database, and a lot of know-how and guidance for many different types of stakeholders (market surveillance authorities, testing laboratories, manufacturers, retailers, consumers).

Register on the project website and follow it and its News items to learn more about the project shop visits and product testing activities!

www.compliantv.eu

Appendix:
Test report template

IEE Project ComplianTV

TEST REPORT **Ecodesign and energy labelling requirements for televisions** Measurement of implementing measures from Directive 2009/125/EC on the Ecodesign of energy--related products and Directive 2010/30/EU on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products (Please fill in all areas in grey)	
13.1.1 Report	
Report Reference No.:	XXX
Compiled by (+ signature):	Name
Approved by (+ signature):	Name
Date of issue:	DD-MM-YYYY
Contents:	XX pages
Testing Laboratory:	Name Department
Address:	Street No, Postal Code, City, Country
Testing location:	
Test specification:	
Regulation: Test procedure: Non-standard test method:	**COMMISSION REGULATION (EC) No. 642/2009 of 22nd July 2009** (Ecodesign requirements for televisions) **COMMISSION DELEGATED REGULATION (EU) No. 1062/2010 of 28th September 2010** (Energy labelling of televisions) Information test N/A
Test item description:	(Please describe here shortly the item which shall be tested e.g. Colour TV)
Manufacturer / brand name:	
Model / type reference:	XXX
Series number:	XXX
Display technology (and backlight technology: CCFL / LED / OLED)	Plasma / OLED/ LCD with CCFL / LED backlight
Test items additional functionalities:	(Short description)
Declared Display size:	XX inches
Peak luminance ratio value:	
Power supply unit type:	
Power switch:	With (easily visible / not easily visible) / Without
Software (version/revision number):	XXX
Forced menu	With (tested in home-mode) / Without (tested in on-mode as shipped)
Auto power down setting	XX:XX HH:mm
Product declaration / Labelling:	Yes / No
Energy Efficiency Class:	

On-Mode power consumption:	XX	W
Annual power consumption:	XX	kWh/a
Standby power consumption:	XX	W
Off-mode power consumption:	XX	W

Photo/Copy of name plate:
(Insert photo)

Photo of energy efficiency label:
(Insert photo)

Photo of product fiche:
(Insert photo)

Date of access to the website:
(Insert date)
(Insert link to the website)

Photo of the easily visible switch:
(Insert photo)

Photo of the whole product:
Front:
(Insert photo)

Back:
(Insert photo)

Open:
(Insert photo)

13.1.2 Test case verdicts	
Test case does not apply to the test item:	N/A or N
Test item does meet the requirement:	P (Pass)
Test item does not meet the requirement:	F (Fail)
Test item not checked:	NC
13.1.3 Testing	
Date of receipt of test item:	DD-MM-YYYY
Date(s) of performance of test:	DD-MM-YYYY
Description of tested Equipment under Test (EUT):	
Power supply:	(reference/type)
Display unit:	(reference/type)
Ambient conditions:	(temperature, etc.)
Mains supply system:	(voltage and frequency of the main supply system, voltage harmonics distortion)
Purchase information:	
Shop name:	
Address and country:	
Website of the shop:	

13.1.4 General remarks

- This report shall not be reproduced except in full without the written approval of the testing laboratory.
- The test results presented in this report relate only to the item tested.
- ”(see remark #)“ refers to a remark appended to the report and „(see Annex #)“ refers to an annex appended to the report.
- Throughout this report, a comma is used as the decimal separator.
- List of test equipment must be kept on file and available for review.
- Other remarks: (please specify) …..

Summary of Testing and Conclusions		
1.	**Regarding "ON-MODE POWER CONSUMPTION"** The television set complies with phase **X** (e.g. phase 2) of the Ecodesign requirements of COMMISSION REGULATION (EC) No. 642/2009 (into force from 1st April 2012). **Result: Yes / No**	
2.	**Regarding "STAND-BY/OFF MODE POWER CONSUMPTION"** The television set complies with phase **X** of the Ecodesign requirements of COMMISSION REGULATION (EC) No. 642/2009 (into force from 20th August 2011). **Result: Yes / No**	
3.	**Regarding "HOME MODE"** The television set complies with the Ecodesign requirements of COMMISSION REGULATION (EC) No. 642/2009 (into force from 20th August 2010). **Result: Yes / No / N/A** Device is providing a forced menu. **Result: Yes / No**	
4.	**Regarding "PEAK LUMINANCE RATIO"** The television set complies with the Ecodesign requirements of COMMISSION REGULATION (EC) No. 642/2009 (into force from 20th August 2010). **Result: Yes / No**	
5.	**Regarding Energy Label according to Commission delegated Regulation (EU) 1062/2010** a. The label was supplied with the unit **Result: Yes / No** b. The label format of the television set complies with the requirements of COMMISSION DELEGATED REGULATION (EC) No. 1062 / 2010 (i.e. the label shall be at least 60 mm wide and 120 mm high; the label shall be in colour; the label was not graphically changed. Further information concerning format issues can be found in the Regulation) **Result: Yes / No** c. The calculated annual energy consumption of the television set complies with the requirements of COMMISSION DELEGATED REGULATION (EC) No. 1062 / 2010. **Result: Yes / No** d. Energy Efficiency Class calculated with declared on-mode power consumption: **X** e. Easily visible switch icon used correctly on the label (This is a special format failure. If the TV has no easily visible hard switch, there should be no icon on the label. If the label has a switch icon ticked, but the TV does not have one (easily visible), this is a non-compliance case. If the label has a switch icon without a tick, it has to be referred as a non-compliance case as well since the label cannot be graphically modified.) **Result: Yes / No / N/A** f. Applying Annex I and II of the above mentioned Regulation: The calculated Energy Efficiency Index is: which is equivalent to Energy Efficiency Class: The measured power consumption is: The calculated annual Energy consumption is:	0,XXX X XX,X W XX,X kWh/a

6.	**Regarding the Product Fiche according to Commission delegated Regulation (EU) 1062/2010** The information in the product fiche of the television is provided in the order specified in Regulation (EU) 1062/2010, ANNEX III, point 1 and is made available in the product brochure or other literature provided with the product. **Result: Yes / No**
7.	**Information is provided by the manufacturer as required in Commission delegated Regulation (EC) No. 642/2009, Annex I, point 5** **Result: Yes / No**
8.	**Measuring methods:** AC input data measured with power analyser. Please explain on which basis or standard the on-mode power consumption was measured: …… (e.g. The “Dynamic Broadcast Content” acc. to IEC 62087 ed.2, clause 11.6. was applied.) Please explain on which basis or standard the standby mode power consumption and the uncertainty was measured: …… (e.g. Power consumption in standby-mode is measured acc. to EN 50564 except for the measurement uncertainty which is specified in COMMISSION REGULATION (EC) No. 642/2009) Please explain the test method applied to measure the luminance ratio: …… (short description of the applied test method, e.g. 4 % white image test pattern or manufacturer test pattern or the three-bar video signal specified in IEC 62087 Ed. 2.0, Section 11.5.5 was used. It can be further explained if a stabilised display luminance is achieved by display the three-bar signal not less than 10 minutes. These measurements are scheduled for detecting the luminance value of the EUT in “home-mode” or under the conditions as delivered by the manufacturer. The maximum luminance value of the EUT is measured with the maximum brightness, contrast and back-light which could be adjusted by the setting within the home mode or by using the shop mode.
9.	**The detailed measuring results and adjustments are stated in the attached appendix.**

Measurement of Ecodesign requirements for televisions				
Clause	Requirement – Test	Result – Remark		Verdict (P / F / N / NC)
1	**GENERAL DATA**			
	Safety class of the apparatus:			–
	Power switch provided for condition max. 0,01 W:	XX	W	–
	Switch easily visible	Yes / No		–
2	**RATED ELECTRICAL DATA (NAMEPLATE)**			
	Rated rms input current (I):	XX	A	–
	Rated rms input voltage (U):	XX	V	–
	Rated input power (P):	XX	W	–
	Mains frequency:	XX	Hz	–
3	**TEST RESULTS (ON-MODE POWER CONSUMPTION)**			
	Power measurement with an uncertainty of ≤ 2 % at the 95 % confidence level (measurements are made in accordance with COMMISSION REGULATION (EC) No.642/2009)			
	Came into force on 1st April 2012 (phase 2) (please adapt date and phase if necessary)			
	Measured visible display area:	XX	dm2	–
	Limit for power consumption (max.): P ≤ 16 Watts + (A x 3,4579 Watts/dm²)	XX	W	P / F / N / NC
	Measured power consumption:	XX	W	
4	**TEST RESULTS (STANDBY/OFF MODE POWER CONSUMPTION)**			
	Power measurement of power ≥ 1,0 W made with an uncertainty of ≤ 2 % at the 95 % confidence level (in accordance to EN 50564:2011)	–		P / F / N / NC
	For Maximum Current Ratio (MCR) ≤ 10, measurements of power < 1,0 W are made with an uncertainty ≤ 0,02 W at the 95 % confidence level (measurements are made in accordance with EN 50564;2011) For MCR >10, measurements are made in accordance with EN 50564:2011	–		P / F / N / NC

Measurement of Ecodesign requirements for televisions				
Clause	Requirement – Test	Result – Remark		Verdict (P / F / N / NC)
4	Description how the stand-by mode was selected or programmed:			–
	Came into force on 20th August 2011 (phase 2) (please adapt date and phase if necessary)			
	Used sampling rate for measurement:	XX	1000/s	–
	a) Off-mode (max. 0,3 W)	XX	W	P / F / N / NC
	Except for televisions with an easily visible switch (max. 0,01 W in off-mode):	XX	W	P / F / N / NC
	Any other off-mode (max. 0,5 W)	XX	W	P / F / N / NC
	b) Standby-mode (max. 0,5 W) (Without information or status display)	XX	W	P / F / N / NC
	Standby-mode (max. 1,0 W) (With information or status display)	XX	W	P / F / N / NC
	c) Availability of “off-mode” and /or “standby-mode”			P / F / N / NC
	“Off-mode” and/or “standby-mode”, and/or “another condition” shall be provided which does not exceed the applicable power consumption requirements if connected to mains power source.			P / F / N / NC
	d) Automatic power-down function	*(Please mention whether this function exists and whether it is enabled in delivery state)*		P / F / N / NC
	Sequence of events to reach the mode where the television automatically changes modes:			P / F / N / NC
	(i) After no more than 4 hours in “on mode” without any user interaction and/or channel change the television shall be automatically switched from “on-mode” to		–	–
	“standby-mode”, or	Time: XX		P / F / N / NC
	“off-mode”, or	Time: XX		P / F / N / NC
	“another condition”.	Time: XX		P / F / N / NC
	(ii) Televisions shall display an alert message before the automatic switch from on mode to the applicable condition/modes.	Yes / No		

Measurement of Ecodesign requirements for televisions				
Clause	Requirement – Test	Result – Remark		Verdict (P / F / N / NC)
5	**"HOME-MODE" FOR TELEVISIONS DELIVERED WITH A FORCED MENU**			
	Came into force on 20th August 2010			
	"Home-mode" provided, which shall be the default choice on initial activation	Yes / No		P / F / N / NC
	If a different mode than "home--mode" can be selected by the user, a second selection process shall be prompted for confirmation.	Yes / No		P / F / N / NC

6	**PEAK LUMINANCE RATIO**			
	Came into force on 20th August 2010			
	For televisions without forced menu: (if relevant)			
	Peak luminance of the on-mode condition as delivered by the manufacturer shall not be less than 60% of the peak luminance of the brightest on-mode condition provided by the television. (in accordance to Annex III, 2. (c))	Indicate selected mode for the brightest condition, and associated parameters: home mode / shop mode / custom mode		P / F / N / NC
	Delivery state:	XX	cd/m²	
	Max. adjustable brightness:	XX	cd/m²	
	Calculated ratio:	XX	%	
	For Televisions with forced menu: (if relevant)			
	Peak luminance of the home-mode condition shall not be less than 60 % of the peak luminance of the brightest on-mode condition provided by the television. (in accordance to Annex III, 2. (c))			P / F / N / NC
	Home mode:	XX	cd/m²	
	Max. adjustable brightness mode:	XX	cd/m²	
	Calculated ratio:	XX	%	
	Are parameters adjustable in shop mode:	Yes / No		–

Measurement of Ecodesign requirements for televisions				
Clause	Requirement – Test	Result – Remark		Verdict (P / F / N / NC)
7	**ENERGY EFFICIENCY INDEX AND ANNUAL POWER CONSUMPTION ACCORDING DELEGATED REGULATION (EU)1062/2010 (Came into force on 30th November 2011)**			
	To calculate the EEI, the on-mode power consumption could be reduced by 5 %, if luminance is automatically reduced between an ambient light intensity of at least 20 lux and 0 lux and if automatic brightness control is activated.			
	Energy Efficiency Index (EEI):			
	$EEI = P_{measured} / P_{ref}$	$A_{measured}$ = XX	dm^2	P / F / N / NC
	$P_{ref} = P_{basic} + A \times 4{,}3224\ W/dm^2$	P_{basic} = XX	W	
		$P_{measured}$ = XX	W	
		P_{ABC} = XX	W	
		P_{ref} = XX	W	
	Energy Efficiency Index (EEI)	**EEI = 0,XX is equivalent** to **EEC = Y**		
	Energy Efficiency Class (EEC)[13]			
	EEIABC = EEI x 95%			P / F / N / NC
	Annual on-mode energy consumption:			
	E in kWh = 1,46 x $P_{measured}$	E = XX,X	kWh	P / F / N / NC
	E_{ABC} = E x 95 % (only if the automatic brightness control requirements are fulfilled)	E_{ABC} = XX,X	kWh	P / F / N / NC

13 According to delegated Regulation (EU) 1062/2010 ranges of EEI are assigned to a specific Energy Efficiency Classes (EEC).

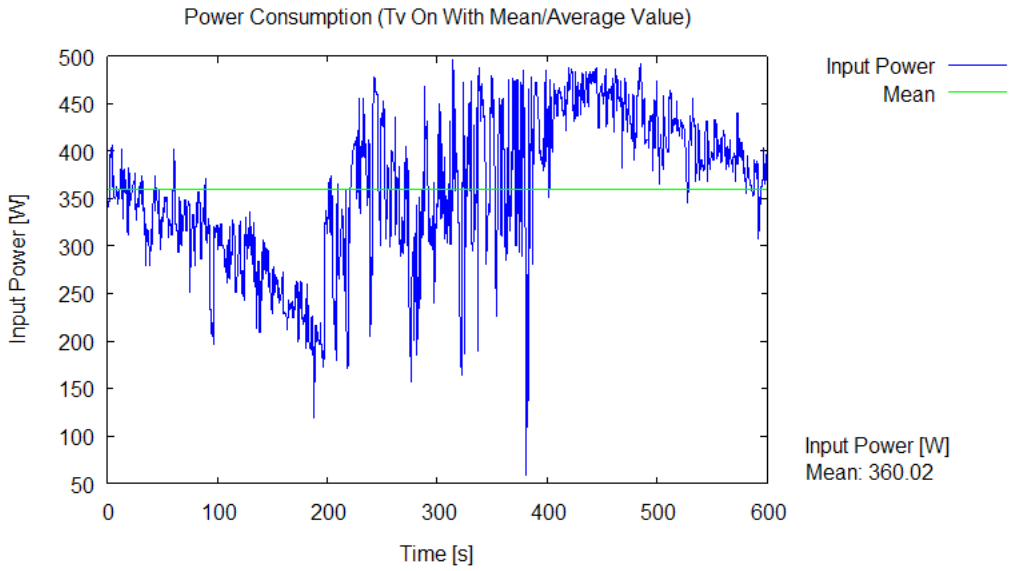
TABLE: list of measurement device

No	Type	Device No.	Calibration date		Remarks
			Last	Next	

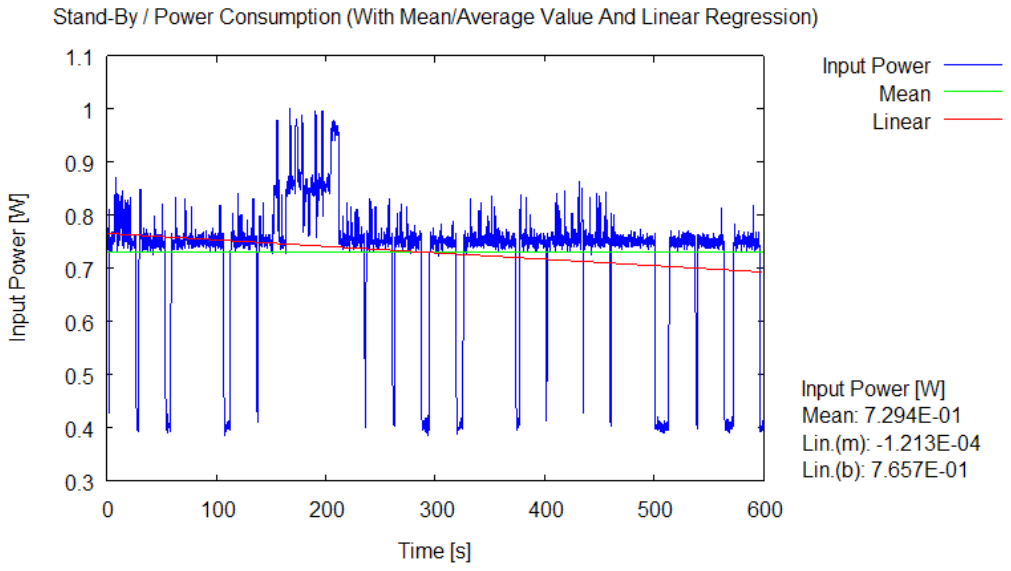
Appendix 1: Measuring results

(The following diagrams are given for illustrative purposes only)

On mode:



Stand-by:



Appendix 2: Settings/adjustments used:

On-mode and luminance in on-mode:

Documentation of all the implemented settings (Screenshots of On-screen Display [OSD]) for the measurement of power consumption in the on-mode and respective luminance.

For maximum luminance, the settings/adjustments changed in comparison to on-mode:

Documentation of all the implemented settings (Screenshots of On-screen Display [OSD]) for the measurement of maximum luminance

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